Imagine COMMUNICATIONS™

Installation and Operation Manual

Selenio 6800™
HFS6801+ HD/SD TV
Video Frame Synchronizer

Edition B

175-000263-00

Delivering the Moment

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HFS6801+

HD/SD TV Video Frame Synchronizer

Installation and Operation Manual

Edition B
April 2007

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Preface

Manual Information

Purpose

This manual details the features, installation procedures, operational procedures, and specifications of the HFS6801**+** HD / SD TV Video Frame Synchronizers.

Audience

This manual is written for engineers, technicians, and operators responsible for the installation, setup, and/or operation of HFS6801**+** HD / SD TV Video Frame Synchronizers.

Revision History

Table P-1. Document Revision History

Edition	Date	Revision History
A	August 2005	Initial release
B	April 2007	Addition of firmware upgrade procedure and minor updates to content

Writing Conventions

To enhance your understanding, the authors of this manual have adhered to the following text conventions:

Table P-2. Writing Conventions

Term or Convention	Description
Bold	Indicates dialog boxes, property sheets, fields, buttons, check boxes, list boxes, combo boxes, menus, submenus, windows, lists, and selection names.
Italics	Indicates email addresses, the names of books or publications, and the first instances of new terms and specialized words that need emphasis.
CAPS	Indicates a specific key on the keyboard, such as ENTER, TAB, CTRL, ALT, or DELETE.
`Code`	Indicates variables or command-line entries, such as a DOS entry or something you type into a field.
>	Indicates the direction of navigation through a hierarchy of menus and windows.
hyperlink	Indicates a jump to another location within the electronic document or elsewhere
Internet address	Indicates a jump to a Web site or URL
	Indicates important information that helps to avoid and troubleshoot problems.

Obtaining Documents

Product support documents can be viewed or downloaded from our Web site at www.broadcast.harris.com/leitch (go to **Support> Documentation**). Alternatively, contact your Customer Service representative to request a document.

Unpacking/Shipping Information

Unpacking a Product

This product was carefully inspected, tested, and calibrated before shipment to ensure years of stable and trouble-free service.

1. Check equipment for any visible damage that may have occurred during transit.
2. Confirm that you have received all items listed on the packing list.
3. Contact your dealer if any item on the packing list is missing.
4. Contact the carrier if any item is damaged.
5. Remove all packaging material from the product and its associated components before you install the unit.

Keep at least one set of original packaging, in the event that you need to return a product for servicing.

Product Servicing

Except for firmware upgrades, HSFS6800**+** modules are not designed for field servicing. All hardware upgrades, modifications, or repairs require you to return the modules to the Customer Service center.

Returning a Product

In the unlikely event that your product fails to operate properly, please contact Customer Service to obtain a Return Authorization (RA) number, then send the unit back for servicing.

Keep at least one set of original packaging in the event that a product needs to be returned for service. If the original package is not available, you can supply your own packaging as long as it meets the following criteria:

- The packaging must be able to withstand the product's weight.
- The product must be held rigid within the packaging.
- There must be at least 2 in. (5 cm) of space between the product and the container.
- The corners of the product must be protected.

Ship products back to us for servicing prepaid and, if possible, in the original packaging material. If the product is still within the warranty period, we will return the product prepaid after servicing.

Restriction on Hazardous Substances (RoHS) Compliance

Directive 2002/95/EC—commonly known as the European Union (EU) Restriction on Hazardous Substances (RoHS)—sets limits on the use of certain substances found in electrical and electronic equipment. The intent of this legislation is to reduce the amount of hazardous chemicals that may leach out of landfill sites or otherwise contaminate the environment during end-of-life recycling. The Directive, which took effect on July 1, 2006, refers to the following hazardous substances:

- Lead (Pb)
- Mercury (Hg)
- Cadmium (Cd)
- Hexavalent Chromium (Cr-V1)
- Polybrominated Biphenyls (PBB)
- Polybrominated Diphenyl Ethers (PBDE)

According to this EU Directive, all products sold in the European Union will be fully RoHS-compliant and "lead-free." (See our Web site, www.broadcast.harris.com/leitch, for more information on dates and deadlines for compliance.) Spare parts supplied for the repair and upgrade of equipment sold before July 1, 2006 are exempt from the legislation. Equipment that complies with the EU directive will be marked with a RoHS-compliant emblem, as shown in Figure P-1.

Figure P-1. RoHS Compliance Emblem

Waste from Electrical and Electronic Equipment (WEEE) Compliance

The European Union (EU) Directive 2002/96/EC on Waste from Electrical and Electronic Equipment (WEEE) deals with the collection, treatment, recovery, and recycling of electrical and electronic waste products. The objective of the WEEE Directive is to assign the responsibility for the disposal of associated hazardous waste to either the producers or users of these products. As of August 13, 2005, the producers or users of these products were required to recycle electrical and electronic equipment at end of its useful life, and may not dispose of the equipment in landfills or by using other unapproved methods. (Some EU member states may have different deadlines.)

In accordance with this EU Directive, companies selling electric or electronic devices in the EU will affix labels indicating that such products must be properly recycled. (See our Web site, www.broadcast.harris.com/leitch, for more information on dates and deadlines for compliance.) Contact your local sales representative for information on returning these products for recycling. Equipment that complies with the EU directive will be marked with a WEEE-compliant emblem, as shown in Figure P-2.

Figure P-2. WEEE Compliance Emblem

Safety

Carefully review all safety precautions to avoid injury and prevent damage to this product or any products connected to it. If this product is rack-mountable, it should be mounted in an appropriate rack using the rack-mounting positions and rear support guides provided. It is recommended that each frame be connected to a separate electrical circuit for protection against circuit overloading. If this product relies on forced air cooling, it is recommended that all obstructions to the air flow be removed prior to mounting the frame in the rack.

If this product has a provision for external earth grounding, it is recommended that the frame be grounded to earth via the protective earth ground on the rear panel.

IMPORTANT! Only qualified personnel should perform service procedures.

Safety Terms and Symbols in this Manual

WARNING

Statements identifying conditions or practices that may result in personal injury or loss of life. High voltage is present.

CAUTION

Statements identifying conditions or practices that can result in damage to the equipment or other property.

Chapter 1

Introduction

Overview

The HFS6801**+** is an HD and SD TV processing module capable of retiming an I/O signal to a local station clock and allowing the clean processing of all synchronized signals. The module provides video frame synchronization and delay for HD and SD TV signals, and picture control through a video-processing amplifier.

The following topics are described in this chapter:

- "Product Description" on page 2
- "Module Descriptions" on page 4
- "Signal Flow" on page 7

Product Description

General Description

The HFS6801**+** HD and SD TV Video Frame Synchronizer module provides a SDI digital input, two active reclocked SDI outputs, four synchronized SDI outputs, and a genlock reference video input. A special output provides hot switch and I/O delay signals for tracking audio processing.

The HFS6801**+** module's reference input (located on the back connector) and the 6800**+** frame's genlock connector both provide a reference signal.

This module can be controlled locally (via card edge) or controlled and monitored remotely with control software applications such as **+**Pilot Lite™, CCS™ Pilot™, and CCS Navigator™, or CCS-compliant remote control panels and other products.

The back connectors for HFS6801**+** requires two frame slots within an FR6802**+** frame (there is no backward-compatibility provided for use with 6800/7000 series frames).

Main Features

Important HFS6801**+** features include the following:

- Inputs:
  - One serial digital SMPTE 292M/SMPTE 259M SDI input
  - Genlock (composite or Tri-Level sync)
- Outputs:
  - Two serial digital SMPTE 292M/SMPTE 259M SDI reclocked outputs
  - Four synchronized serial digital SMPTE 292M/SMPTE 259M SDI reclocked outputs
  - One DATA I/O signal for tracking audio processing
- Capability for operating the following video standards:
  - 1080i (interlaced), 25/29.97/30 Hz
  - 1080p (progressive), 23.98/24/25/29.97/30 Hz
  - 720p (progressive), 50/59.94/60 Hz
  - Standard definition 525/625
- Auto-detect or user-forced input video standard
- 10-bit video processing
- Digital equalization (supports Belden 8281 and newer, thin coax cables like Alcatel SD02)
- VANC and HANC sample passing capability
- Clean handling of hot switch on input
- Up to 8 frames less 2 lines of video delay for 1080i/1080p standards, 16 frames less 2 lines for 720p standards, and 1 frame for 525/625 standards
- Pass, black, and freeze loss of video modes
- Video processing amplifier with luminance gain, luminance offset, and chrominance gain controls
- Shadowed / restored parameter settings when switching video standards
- Card-edge control
- Serial and Ethernet remote control and monitoring

Module Descriptions

Front Module

Figure 1-1 is a generic top-front view of a typical 6800**+** module and shows the general location of standard LEDs, controls, and jumpers. The number of Control and Monitoring LEDs on 6800**+** modules varies.

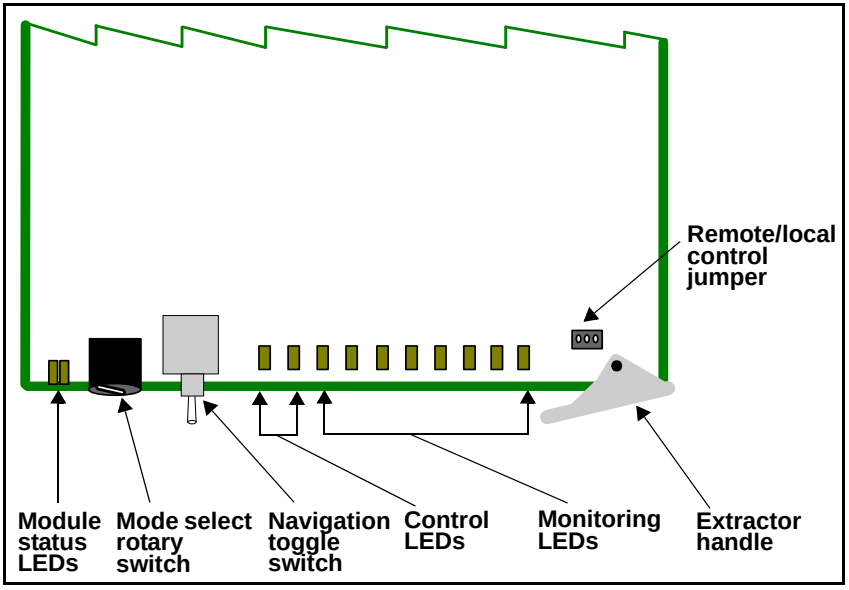

Figure 1-1. Typical 6800**+** Module

Table 1-1 on page 5 briefly describes generic 6800**+** LEDs, switches, and jumpers. See "Chapter 3: Operation" for more information on specific HFS6801**+** module controls, LEDs, and jumpers.

Table 1-1. Generic 6800+ Module Features

Feature	Description
Module status LEDs	Various color and lighting combinations of these LEDs indicate the module state. See “Monitoring LEDs” on page 35 for more information.
Mode select rotary switch	This switch selects between various control and feedback parameters.
Navigation toggle switch	This switch navigates up and down through the available control parameters: • **Down**: Moves down through the parameters • **Up**: Moves up through the parameters
Control LEDs	Various lighting combinations of these Control LEDs (sometimes referred to as “Bank Select LEDs”) indicate the currently selected bank. See Table 3-2 “Selected Bank as Indicated by Control LEDs” for more information.
Monitoring LEDs	Each 6800+ module has a number of LEDs assigned to indicate varying states/functions. See “Monitoring LEDs” on page 35 for a description of these LEDs.
Local/remote control jumper	• **Local**: Locks out external control panels and allows card-edge control only; limits the functionality of remote software applications to monitoring • **Remote**: Allows remote or local (card-edge) configuration, operation, and monitoring of the HFS6801+

Back Connectors

Figure 1-2 shows the double-slot back connector used by the HFS6801**+** module when installed in an FR6802**+**XF frame.

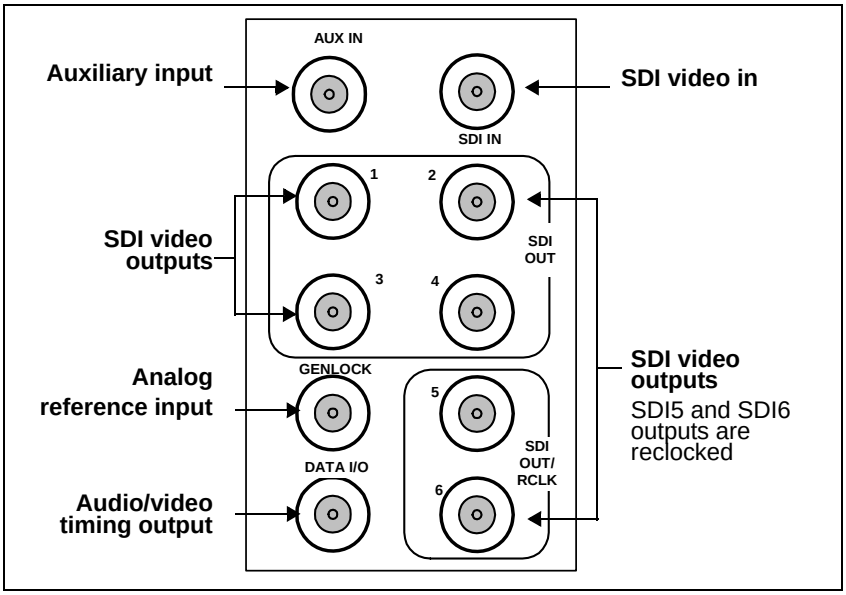

Figure 1-2. HFS6801**+** Back Connector

Signal Flow

Figure 1-3 shows the basic signal flow of the HFS6801+ modules.

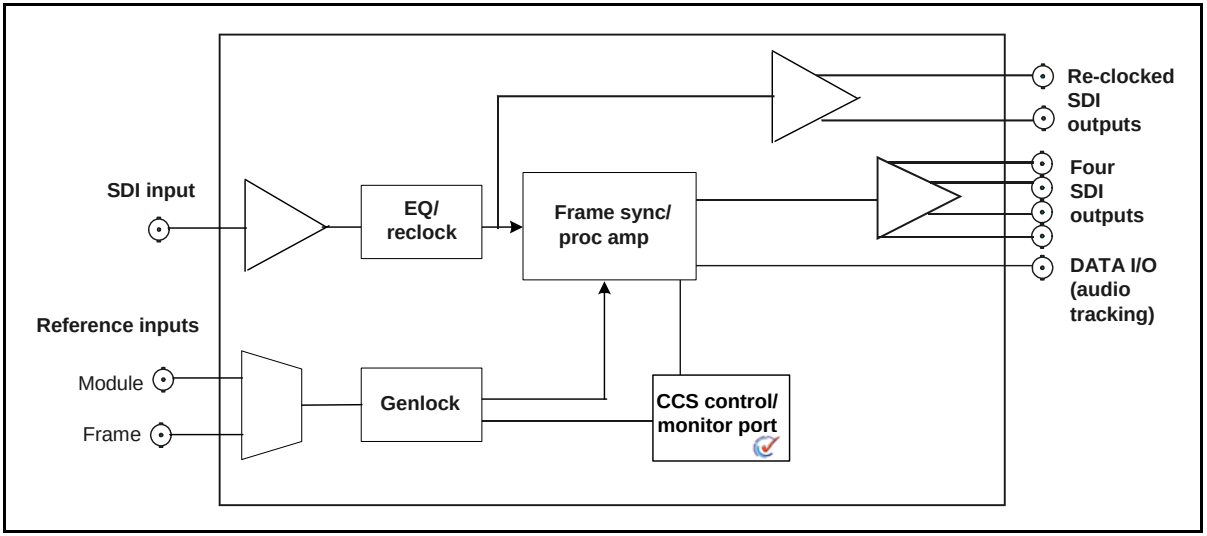

Figure 1-3. HFS6801+ Signal Flow Diagram

Chapter 2

Installation

Overview

This chapter describes the HFS6801**+** installation process, including the following topics:

- “Maximum 6800+ Frame Power Ratings” on page 10
- “Unpacking the Module” on page 11
- “Setting Jumpers” on page 12
- “Installing 6800+ Modules” on page 14
- “Making Connections” on page 15
- “Upgrading Module Firmware” on page 16

See the *FR6802**+** Frame Installation and Operation Manual* for information about installing and operating an FR6802**+**XF frame and its components.

Caution

Before installing this product, read the *6800**+** Series Safety Instructions and Standards Manual* shipped with every *FR6802**+** Frame Installation and Operation Manual* or downloadable from our Web site at www.broadcast.harris.com/leitch. This safety manual contains important information about the safe installation and operation of 6800**+** series products.

Maximum 6800+ Frame Power Ratings

The power consumption for a HFS6801**+** module is 7 W from the positive supply and 0.3 W from the negative supply.

Table 2-1 describes the maximum allowable power ratings for 6800**+** frames. Note the given maximums before installing any 6800**+** modules in your frame.

Table 2-1. Maximum Power Ratings for 6800**+** Frames

6800+ Frame Type	Max. Frame Power Dissipation	Number of Usable Slots	Max. Power Dissipation Per Slot
FR6802**+**XF (frame with AC power supply)	120 W	20	6 W
FR6802**+**XF48 (frame with DC power supply)	105 W	20	5.25 W
FR6802**+**QXF frame (with AC or DC power supply)	120W	20	6 W

Unpacking the Module

Preparing the Product for Installation

Before you install the HFS6801+, perform the following:

- Check the equipment for any visible damage that may have occurred during transit.
- Confirm receipt of all items on the packing list. See "Checking the Packing List" for more information.
- Remove the anti-static shipping pouch, if present, and all other packaging material.

Note

Contact your Customer Service representative if parts are missing or damaged.

- Retain the original packaging materials for possible re-use.

See "Unpacking/Shipping Information" on page ix for information about returning a product for servicing.

Checking the Packing List

Table 2-2. Available Product Packages

Ordered Product	Content Description
HFS6801+	• One front module • One *HFS6801+ HD / SD TV Video Frame Synchronizers Installation and Operation Manual*
HFS6801+D	• One front module • One back connector • One *HFS6801+* HD / SD TV Video Frame Synchronizers *Installation and Operation Manual*
HFS6801+DR	One back connector

Setting Jumpers

The HFS6801**+** module has one standard jumper for remote or local control. Figure 2-1 shows the location of the **REM/LOC** jumper.

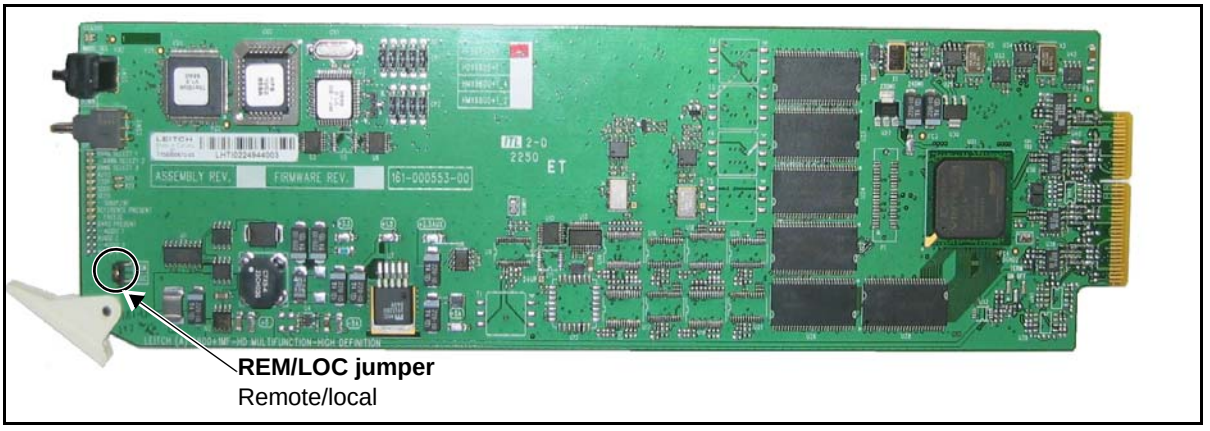

Figure 2-1. Location of the **REM/LOC** Jumper

Note

You need to configure modules for local or remote operation prior to power-up. To change the configuration, first remove power from the module, reset the jumper, and then reapply power.

Follow this procedure to set the **REM/LOC** jumper for either remote or local control:

1. Locate the **REM/LOC** control jumper on the module (beside the extractor handle).

   Figure 2-1 shows the standard location of the **REM/LOC** jumper.

2. Place a jumper on pins 1 and 2 to set the module for Remote control or pins 2 and 3 to set the module for Local control. See Figure 2-2.

Note

The white triangle near the jumper pins on the module indicates pin 1.

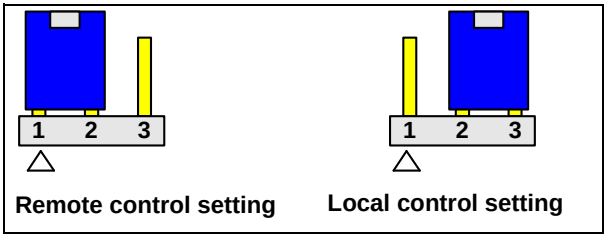

Figure 2-2. REM/LOC Settings for Remote and Local Control

See Table 1-1 on page 5 for more information on local/remote control jumper functionality.

Installing 6800+ Modules

Required Frames and Back Connector Types

The HFS6801**+** modules have double-width back connectors that can be installed in an FR6802**+**XF or FR6802**+**QXF frame. HFS6801**+** modules cannot be installed in a FR6802**+**DM frame, a FR6800/7000 frame, or a frame without fans.

See the *FR6802**+** Frame Installation and Operation Manual* for details on installing back connectors in an FR6802**+** frame.

A FR6802**+**RM (Rear Support Extension Rails for 6800**+** series frames) option is recommended for the HFS6801**+** modules. See your *FR6802**+** Frame Installation and Operation Manual* for installation instructions.

Installing and Removing Modules

These modules require no specialized installation or removal procedures. However, if installing both front and rear modules, ensure that the back module is installed first before plugging in the front module.

Caution

Before removing, inserting, or replacing a back module in your frame, you must remove power from the frame. Failure to power down the frame could result in damage to the frame, modules, or power supply.

When removing both the front and rear modules, ensure that the front module is unplugged from the frame first, before removing the rear module.

- See the *FR6802**+** Frame Installation and Operation Manual* for information about installing and operating an FR6802**+** frame and its components.
- See the *6800**+** Safety Instructions and Standards Manual* for important information about safely installing your module.

Making Connections

Once you have installed the HFS6801**+** module, you can connect it to the appropriate input and outputs.

Note that the data I/O output provides reference signals for 6800**+** audio tracking modules. It can drive up to four chained audio modules over coaxial cable up to 985 ft (300 m) long. If you wish to connect to more than one audio module, you will achieve the best results if yoou use T-connectors.

See the applicable audio module *Installation and Operation* manual for complete connection instructions.

Upgrading Module Firmware

Firmware upgrading is a routine procedure that you must perform to install newer versions of software on 6800**+** modules. CCS Pilot, CoPilot, or Navigator software version 3.1.1 or later is required for this procedure. The frame must contain or be connected to another frame that contains an ICE6800**+** or a 6800+Eth module.

Note

Firmware for the HFS6801**+** must be updated in Boot Loader mode.

In the unlikely event that the upgrade fails (because of such situations as network interruptions, power failures, etc.), the module may not respond to controls and will appear to be non-functional. In that event, follow the procedures described in “Correcting a Failed Upgrading Procedure” on page 20.

Upgrading the Firmware

You can upgrade your 6800**+** module’s firmware using the Software Upgrade tool. This tool is included with CCS Pilot, Co-Pilot, or Navigator software version 3.1.1 or later.

Caution

The **File Transfer** tab is not meant to be used for firmware upgrades. For best results, use the Software Uprade tool to upgrade module firmware.

To upgrade your module’s firmware, follow these steps:

1. Download the most recent appropriate upgrade package from our Web site or from your CD-ROM.

2. Remove the module from the 6800**+** frame.

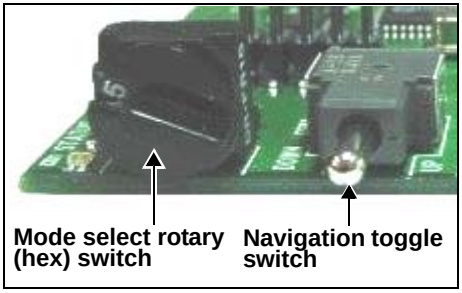

Figure 2-3. Buttons on a Typical Card Edge

3. Set the Hex switch to **F**.
4. While pressing the Navigation toggle switch down, reinsert the module into the frame and then release the Navigation toggle switch.
5. Perform a Discovery operation to discover the module, as described in “Discovering a DAV6800+ Module” on page 30.

   Information about discovering modules can also be found in your CCS software application manual or online help. (If you cannot discover the device, see “Manually Adding a Device to the Discovery or Network Folder” on page 21.)

6. From the **Tools** menu, select **Software Upgrade**.

   The **Software Upgrade** window opens or is brought to the foreground.

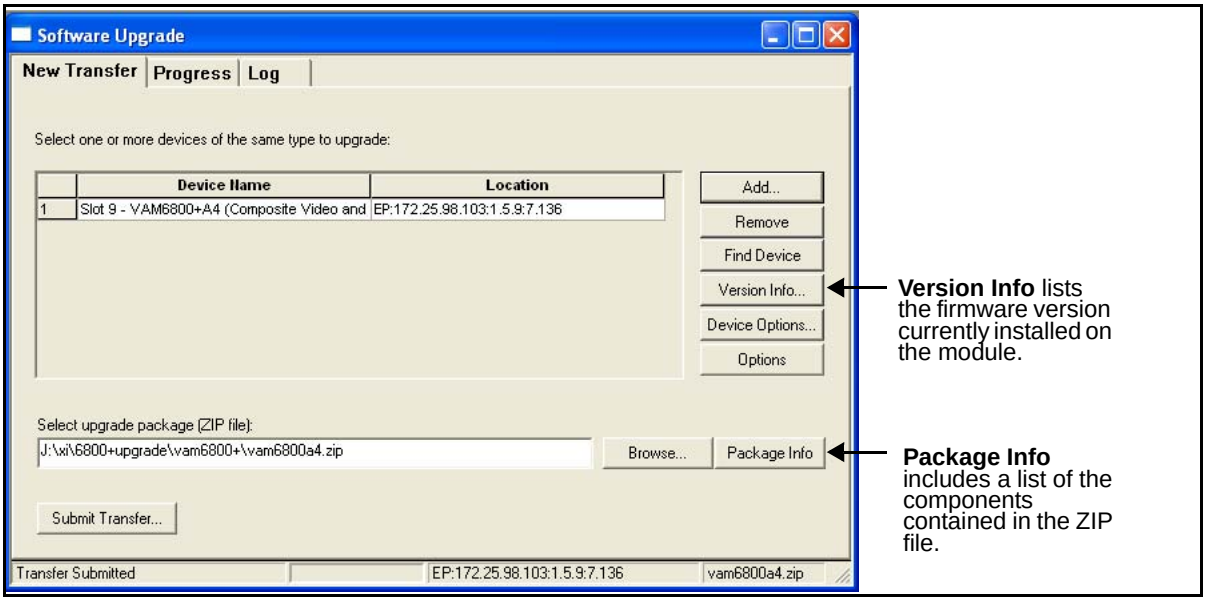

Figure 2-4. Software Upgrade Tool's New Transfer Tab

7. On the **New Transfer** tab, click **Add**.

   The **Device Selection** dialog opens.

8. Select one or more devices, and then click **OK** to close the **Add Device** dialog box.

   > You can only add one unit from each IP address. All items in a frame have the same IP address.

   The selected devices appear in the table under **Device Name**. These devices will receive the same upgrade package.

9. Before proceeding with the firmware upgrade, you can—
   - Highlight the module's position in the Navigation window by clicking **Find Device**.
   - View the firmware version currently installed on the module by clicking **Version Info**.

10. Press **Browse...** to select the software upgrade package (ZIP file).

    A standard **Windows File Selection** dialog opens.

11. Choose the upgrade ZIP file on a local or network drive.

    The selected file's path name is displayed in the edit box to the left of the **Browse…** button.

    The extraction process on the ZIP file is handled as part of the upgrade process. You do not need to extract the files yourself. You can view the contents of the ZIP file by clicking **Package Info.**

12. Press **Submit Transfer...**

    A dialog box opens, requesting confirmation that you want to proceed with the request. If you have multiple devices selected, multiple transfer tasks are submitted—one per device.

    The transfer now progresses. You may minimize the **Software Upgrade** window, continue with other tasks, or switch to the **Progress** tab to view the status of the transfers.

    Closing the **Software Upgrade** window does not effect any of the transfer processes that may be running in the background. If you try to log off or exit the CCS software while a transfer is underway, a notification window will alert you that processes are still active and will ask if you want to terminate these processes.

13. Click on the **Log** tab and look at the **Progress** column to ensure that all files have correctly updated.

14. When the update is complete, reboot the module by manually pulling it out and then pushing it back into its slot in the frame.

    You cannot click **Reboot Device** to reboot 6800**+** modules that must be upgraded in Boot Loader mode.

Your upgrade procedure is complete.

If for some reason the upgrade fails, the module may not respond to controls and will appear to be non-functional. In that event, follow the procedures described in "Correcting a Failed Upgrading Procedure" on page 20.

Correcting a Failed Upgrading Procedure

Firmware upgrades may fail in the event of network interruptions, power failures, or if the wrong upgrade package was transferred to the module. These problems can be corrected by upgrading the firmware while the module is in Boot Loader mode. The upgrade won't work unless you put the module in Boot Loader mode.

Note

If you have not already downloaded the most recent appropriate upgrade package from our Web site or from your CD-ROM, do so now.

Putting the Module in Boot Loader Mode

Follow these steps to put your the module in Boot Loader mode:

1. Remove the affected module from the 6800**+** frame.

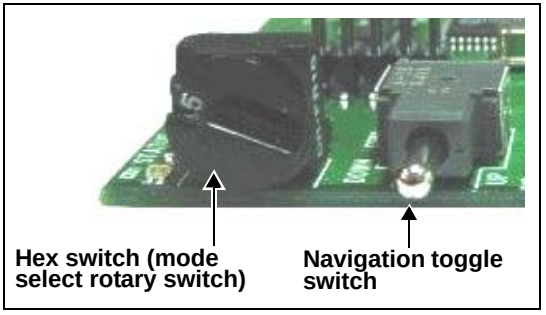

Figure 2-5. Buttons on a Typical Card Edge

2. Set the hex switch to **F**.
3. While pressing the Navigation toggle switch down, reinsert the module into the frame.

If your device is listed in the **Discovery** or **Network** folder, you can continue the firmware upgrade as described in "Upgrading the Firmware" begining with step **6** on page 18. If not, you must manually add the device to the **Discovery** or **Network** folder. To do this, see the next section.

Manually Adding a Device to the Discovery or Network Folder

If your device is not listed in the **Discovery** or **Network** folder, you must manually add it to these folders. After you add the device, you can use the **Software Upgrade** dialog box to continue with the module firmware upgrade.

To manually add a device to the **Discovery** or **Network** folder, follow these steps:

1. Enter Build mode, and then drag or copy and paste the module's device icon from the **Catalog** folder into the **Network** or **Discovery** folder.
2. Right-click the device icon, and then select **Properties**.
3. On the **Device** tab of the **Navigation Properties** box, enter the IP address of the frame that holds the module. (See Figure 2-6.)

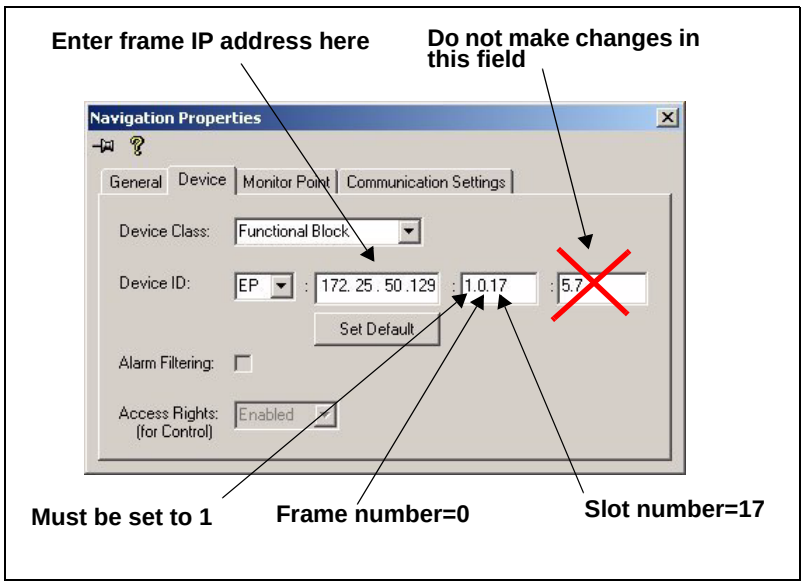

Figure 2-6. Navigation Properties Box

Caution

If you make changes in the last field (located above and to the right of the **Set Default** button), you may lose your connection to the module. If this happens, you will need to rediscover the module.

4. In the third field, enter

   `1.0.[slotnumber]`

   (where, for example, 1.0.5 would refer to the module in slot 5 of the frame number 0).

5. Close the window.

6. You can now continue your firmware upgrade as described in "Upgrading the Firmware" begining with step **6** on page 18.

Chapter 3

Operation

Overview

This chapter describes how to operate the HFS6801**+** using card-edge controls only. See the following documents for information on how to operate this product remotely:

- *+Pilot Lite User Manual* for serial control interface
- CCS Pilot, CoPilot, Navigator, or RCP-CCS-1U Remote Control Panel manual for Ethernet control interface

The following topics are discussed in this chapter:

- "Operating Notes" on page 24
- "Parameter Availability based on Operating Mode" on page 25
- "Changing Parameter Settings" on page 26
- "Setting HFS6801+ Control Parameters" on page 28
- "LEDs and Alarms" on page 35

Operating Notes

When setting the control parameters on the HFS6801**+**, observe the following:

- If you make changes to certain parameters, other related parameters may also be affected. See the section “Setting HFS6801+ Control Parameters” on page 28 for more information.
- When you change a parameter, the effect is immediate. However, the module requires up to 20 seconds to save the latest change. After 20 seconds, the new settings are saved and will be restored if the module loses power and must be restarted.
- When you set the **Factory Recall** parameter to **Yes**, the module takes several seconds to reset all of the parameters to their default settings.
- For proper operation, the output HD standard frame rate should match or be double the reference standard frame rate.
- For best results, terminate any unused coaxial output connectors with a 75Ω terminator.

See “Parameter Availability based on Operating Mode” on page 25 for more operational information.

Parameter Availability based on Operating Mode

Depending on whether the operating mode is HD or SD, some parameters will be enabled and some disabled. The HD parameters will apply when SdiStdSet is set to one of the HD operating modes, or when the SdiStdSet is set to Auto and SdiStdFdbk is one of the HD operating modes. The SD parameters will apply when SdiStdSet is set to either SD 525 or SD 625, or the SdiStdSet is set to Auto and SdiStdFdbk is SD 525 or SD 625.

Note

The parameter **Hue** is only available in **SD 525** mode.

Table 3-1. Parameter Availability Based on Operating Mode

Condition	Enabled Parameters	Disabled Parameters
HD Operating Mode: • 1080i/30 • 1080i/29.97 • 1080i/25 • 1080p/30 • 1080p/29.97 • 1080p/25 • 1080p/24 • 1080p/23.98 • 720p/60 • 720p/59.94 • 720p/50	• Y CRC Error Counter • Y CRC Err Cnt Clear • C CRC Error Counter • C CRC Err Cnt Clear	• Hue • EDH Present • EDH Error Count • EDH Error Clear • In Field Detection
SDI Operating Mode: • SD 525 • SD 625	• Hue • EDH Present • EDH Error Count • EDH Error Clear • In Field Detection	• Y CRC Error Counter • Y CRC Err Cnt Clear • C CRC Error Counter • C CRC Err Cnt Clear

Changing Parameter Settings

Note

For best results, use the available 6800**+** software control options (serial/local or Ethernet/remote) to aid in viewing, setting, and confirming parameter values.

Follow these steps to change the HFS6801**+** parameter settings:

1. Rotate the mode select rotary switch (hex switch) to "0."
2. Once the hex switch is set to "0," toggle the navigation switch up or down to select a bank.

   View the two control LEDs next to the navigation toggle switch to see which bank is currently selected.

Table 3-2. Selected Bank as Indicated by Control LEDs

Bank Select LED 1 **(first top LED)**	**Bank Select LED 2** **(second top LED)**	**Bank Select LED 3** **(third top LED)**	**Bank Number**
Off	Off	Off	0
On	Off	Off	1
Off	On	Off	2
On	On	Off	3
Off	Off	On	4
On	Off	On	5
Off	On	On	6
On	On	On	7

See Table 3-3 on page 29 to view the various banks, hex switch positions, and corresponding parameter options and values.

3. Rotate the hex switch to the parameter number (1 to 9) or letter (A to F) of the option you want to set.
4. Toggle the navigation switch to select and set the value of the chosen parameter.

5. Rotate the hex switch to another parameter number/letter in the current bank, and then repeat step 4.

   or

   Rotate the hex switch to “0” again to select a different bank, and then repeat steps 3 and 4.

Recalling Default Parameter Settings

Table 3-3 on page 29 describes all of the parameter settings for the HFS6801**+** modules, including the original factory defaults. To return this module to its default settings, you can either reset each parameter individually or do a global recall following this procedure:

1. Rotate the hex switch to “0.”
2. Toggle the navigation switch to the bank number “0.”

   Use the control LEDs to verify which bank you have selected, or use an available 6800**+** software control option (serial/local or Ethernet/remote) to aid in confirming your bank selection.
3. Rotate the hex switch to the global recall parameter “F.”
4. Toggle the navigation switch to “On.”

   Use an available 6800**+** software control option to aid in viewing, setting, and confirming the parameter value.

Reading Software and Hardware Versions

The current software version of your HFS6801**+** modules can only be viewed using a CCS-enabled control panel or a CCS software application, such as Pilot or **+**Pilot Lite. See your *RCP-CCS-1U Installation and Operation Manual*, CCS software application user manual, or CCS software application online help for information on viewing software and hardware version numbers.

Setting HFS6801+ Control Parameters

Table 3-3 lists all of the available parameters and options for the HFS6801**+**. *All parameters clip unless otherwise indicated*.

Note

The sequence of options listed in the **Options** column mirrors the sequence achieved when you move the Navigation Toggle switch up.

The On/Off combinations of the control LEDs on the card-edge indicate the active bank number. See “Changing Parameter Settings” on page 26 for more information.

Legend

Bold option = Indicates that this is the default setting for the parameter

[RO] = Indicates that parameters are read-only/feedback, and cannot be used to select controls

1(superscript digit)= Indicates that there is a footnote for this parameter entry, found at the end of the tables

Table 3-3. Parameter Options

Bank, Rotary Switch	Parameter Name	Function	Options
Bank 0			
0, 1	SDI IP Video Std Set	Selects the SDI input video signal standard	• SD 525 • SD 625 • 1080I 30 • 1080I 29.97 • 1080I 25 • 1080P 30 • 1080P 29.97 • 1080P 25 • 1080P 24 • 1080P 23.98 • 720P 60 • 720P 59.94 • 720P 50
0, 2	Y CRC Err Cnt Clear	Clears the luminance CRC error counter	• On • **Off**
0, 3	C CRC Err Cnt Clear	Clears the chrominance CRC error counter	• On • **Off**
0, 4	EDH Error Cnt Clear	Clears EDH error counter	• On • **Off**
0, 5	Frame Sync Mode	Selects the operational mode for the frame synchronizer	• **Sync Mode** • Delay Mode
0, 6	Force Freeze	Forces the output video to freeze	• **Off** • On
0, 7	Freeze Type	Selects the type of manual video freeze	• **Field 1** • Field 2 • Frame
0, 8	Video OP Mode	Selects the output video mode when the input video is disrupted	• Pass • Black • **Freeze**

Table 3-3. Parameter Options *(Continued)*

Bank, Rotary Switch	Parameter Name	Function	Options
0, 9	Vertical Phase *	Adjusts the vertical timing	• 0 to 1124 Ln • 0 to 524 Ln • 0 to 624 Ln • 0 to 749 Ln (see "Cross-Functional Parameter Changes" on page 34)
0, A	Horizontal Phase *	Adjusts the horizontal timing	• 0.0 to 35.542 µs • 0.0 to 22.209 µs • 0.0 to 22.231 µs • 0.0 to 26.653 µs • 0.0 to 29.616 µs • 0.0 to 29.646 µs • 0.0 to 37.024 µs • 0.0 to 37.061 µs • 0.0 to 63.519 µs • 0.0 to 63.963 µs (see cross-functional parameter changes table)
0, B	Delay Range *	Adjusts the amount of frame delay	• **0** to 7 frm • **0** to 1 frm • **0** to 15 frm (see "Cross-Functional Parameter Changes" on page 34)
0, C	Y Offset	Adjusts offset for the Y channel	-100.685 to 100.685 mV **(0.0)**
0, D	Cb Offset	Adjusts offset for the Cb channel	-100.685 to 100.685 mV **(0.0)**
0, E	Cr Offset	Adjusts offset for the Cr channel	-100.685 to 100.685 mV **(0.0)**
0, F	Factory Recall	Recalls the factory settings	• **Off** • On
Bank 1			

Table 3-3. Parameter Options *(Continued)*

Bank, Rotary Switch	Parameter Name	Function	Options
1, 1	Y Gain	Adjusts gain to the luminance channel	-3.0 to 3.0 dB **(0.0)**
1, 2	Cb Gain	Adjusts gain to the Cb color difference component	-3.0 to 3.0 dB **(0.0)**
1, 3	Cr Gain	Adjusts gain to the Cr color difference component	-3.0 to 3.0 dB **(0.0)**
1, 4	Black Clip Level	Sets the black clip level	-47.9 to 47.9 mV **(0.0)**
1, 5	Black Clip	Controls the activation of Black Clip	• **Off** • On
1, 6	White Clip Level	Sets the white clipping level	636.87 to 763.13 mV **(700.0)**
1, 7	White Clip	Controls the activation of White Clip	• **Off** • On
1, 8	Hue	Adjusts the hue of the incoming digital video signal	-180 to 180 ° **(0)**
1, 9	Test Signal Enable	Controls the activation of the internal test signal generator	• **Off** • On
1, A	GL Lock Source	Selects the reference source for the on-board genlock circuit	• **Card Ref** • Frame Ref
1, B	In Field Detection	Selects the input field detection by either V-bit or F-bit	• **V-bit** • F-bit
Remote Control Only			

Table 3-3. Parameter Options *(Continued)*

Bank, Rotary Switch	Parameter Name	Function	Options
[RO]	SDI IP Video Std Fb	Reports the detected HD SDI input video signal standard	• Unknown • 1080P 25 • 720P 59.94 • 720P 60 • 1080P 23.98 • 1080P 24 • 1080P 29.97 • 1080P 30 • 1080I 25 • 1035I 29.97 • 1035I 30 • 1080I 25 (295M) • 1080I 29.97 • 1080I 30 • SD 525 • SD 625 • 720P 50 • 1080PsF 23.98 • 1080PsF 24 • 720P 29.97 • 720P 30 • 720P 25 • 720P 23.98 • 720P 24 • 1080PsF 29.97 • 1080PsF 30
[RO]	SDI IP Video Present	Reports the presence of the HD SDI input video signal	• No • Yes
[RO]	Y CRC Error Counter	Reports the number of occurred luminance CRC errors	0 to 16777215
[RO]	C CRC Error Counter	Reports the number of occurred chrominance CRC errors	0 to 16777215

Table 3-3. Parameter Options *(Continued)*

Bank, Rotary Switch	Parameter Name	Function	Options
[RO]	EDH Present	Reports the presence of EDH in the input SDI signal	• No • Yes
[RO]	EDH Error Count	Reports the number of occurred EDH errors	0 to 32767
[RO]	Vieo Frozen	Reports the output video frozen status	• No • Yes
[RO]	GL Video Present	Reports the presence of the video signal from the external reference source	• No • Yes
[RO]	GL Video Locked	Reports the locked status of the external reference signal	• No • Yes
[RO]	Genlock Std Feedback	Reports the detected Genlock standard	• Unknown • 1080P 25 • 720P 59.94 • 720P 60 • 1080P 23.98 • 1080P 24 • 1080P 29.97 • 1080P 30 • 1080I 25 • 1080I 29.97 • 1080I 30 • SD525 • SD625 • 720P 50 • 1080Psf 23.98 • 1080Psf 24

Notes:
1. The frame rate for both input video and reference video must match.

Cross-Functional Parameter Changes

When you configure certain parameters, you force a change in other associated parameters. The following table describes those parameters affected by other option selections.

An example of a cross-functional change concerns the Horizontal Phase and Vertical Phase parameters. When the Horizontal Phase is controlled from the card edge, any wrap around of the values will cause a corresponding increment or decrement of the Vertical Phase value.

Table 3-4. Parameters That Are Affected by Input Standard and Frame Rate

Parameter Name	SDI Input Video Standard and Frame Rate				
	SD 525	**SD 625**	**1080I/30, 29.97, and 25**	**1080P/30, 29.97, 25, 24 and 23.98**	**720P/60, 59.94, and 50**
Vertical Phase	0 to 524 lines	0 to 624 lines	0 to 1124 lines	0 to 1124 lines	0 to 749 lines
Horizontal Phase	0 to 63.519 µs	0 to 63.963 µs	30: 0 to 29.616 µs 29.97: 0 to 29.646 µs 25: 0 to 35.542 µs	30: 0 to 29.616 µs 29.97: 0 to 29.646 µs 25: 0 to 35.542 µs 24: 0 to 37.024 µs 23.98: 0 to 37.061 µs	60: 0 to 22.209 µs 59.94: 0 to 22.231 µs 50: 0 to 26.653 µs
Delay Range	0 to 1 frm[1]	0 to 1 frm[1]	0 to 7 frm	0 to 7 frm	0 to 15 frm
Freeze Type	• Field 1 • Field 2 • Frame	• Field 1 • Field 2 • Frame	• Field 1 • Field 2 • Frame	Frame	Frame

1 In SD mode (**SD 525** and **SD 625**), **Vertical Phase** and **Horizontal Phase** are disabled when Delay **Range** equals 1.

LEDs and Alarms

Monitoring LEDs

The HFS6801**+** has 9 monitoring LEDs that serve as a quick monitoring reference. Figure 3-1 shows the general location of the monitoring LEDs on a generic 6800**+** module. The table that follows, Table 3-5, describes each LED in more detail.

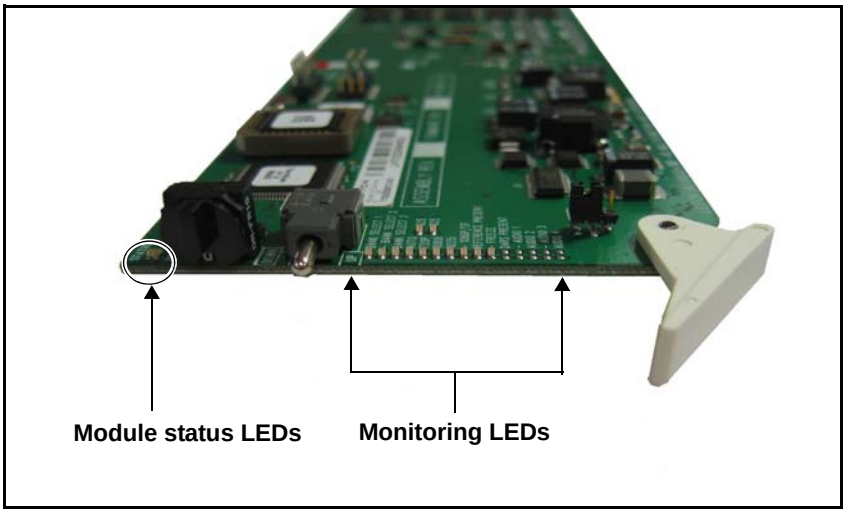

Figure 3-1. Location of Card-Edge LEDs

The 9 monitoring LEDs on the card-edge of HFS6801**+** modules are identified in Figure 3-1 (left to right).

Table 3-5. Monitoring LEDs

LED	Description	Color Indication
Auto	Indicates if auto detection of the input video signal is activated	• GREEN: Auto detect enabled • OFF: Auto detect disabled
720P	Indicates if a 720P video source is present	• GREEN: 720P video present • OFF: 720P video not present

Table 3-5. Monitoring LEDs *(Continued)*

LED	Description	Color Indication
1080I	Indicates if a 1080I video source is present	• GREEN: 1080I video present • OFF: 1080I video not present
1035I	Indicates if a 1035I video source is present	• GREEN: 1035I video present • OFF: 1035I video not present
1080P/sF	Indicates if a 1080P/sF video source is present	• GREEN: 1080P/sF video present • OFF: 1080P/sF video not present
525	Indicates if a 525 video source is present	• GREEN: 525 video present • OFF: 525 video not present
625	Indicates if a 625 video source is present	• GREEN: 625 video present • OFF: 625 video not present
Reference Present	Indicates the presence of the reference signal either from the back module or internally from the NEO frame	• GREEN: Genlock present • OFF: Genlock absent
Freeze	Illuminates if the frame synchronizer circuitry is currently freezing the output video	• AMBER: Output video frozen • OFF: Output video not frozen

Module Status LEDs

The HFS6801**+** module does not have any card-edge alarms. Instead, module status LEDs on the corner of the module light up if an error is detected. See Figure 3-1 on page 35 for the location of these LEDs, and Table 3-6 below for a definition of the LED colors.

Note

If the LED is flashing red, please contact your Customer Service representative.

Table 3-6. Module Status LED Descriptions

LED Color Sequence	Meaning
Off	There is no power to the module; the module is not operational.
Green	There is power to the module; the module is operating properly.
Red	There is an alarm condition.
Flashing red	The module has detected a hardware/firmware fault.
Amber	The module is undergoing configuration.

Alarms

The table below describes the specific alarms for the HFS6801**+** module. You can only identify specific alarms using a software control application (for example, **+**Pilot Lite or Pilot). For more information, see the following:

- Table 3-7 (below) for a list of HFS6801**+** alarms that are logged and monitored via CCS applications
- The appropriate software control user manual or online help for more information

Note

The **RefPresAlarm, RefLockedAlarm** and **RefStdMismatch** alarms are disabled when the **Frame Sync Mode** parameter is set to **Delay Mode**.

Table 3-7. Alarm Descriptions

Alarm Name	Alarm Description	Alarm Level
SDI IP Video Present	Loss of SDI	Major
Video Frozen	Video freeze	Minor
RefPresAlarm	Loss of reference	Major
RefLockedAlarm	Loss of reference_locked	Major
RefStdMismatch	Mismatch between reference video and video standard	Major
StdMisMtch	Video format selection error	Major

Chapter 4

Specifications

Overview

The following specification tables appear in this chapter:

- “SDI Video Input” on page 40
- “SDI Video Output” on page 41
- “Propagation Delay” on page 42
- “Power Consumption” on page 43
- “Operating Temperature” on page 43

Specifications and designs are subject to change without notice.

Inputs

SDI Video Input

Item	Specification
Number	1
Standard	SMPTE 292M HD-SDI and 259M-C SD-SDI
Connector	BNC (IEC169-8)
Impedance	75Ω
Return loss	• >18 dB (typical) from 5 MHz to 1485 MHz HD-SDI mode • >18 dB (typical) to 270 MHz SD-SDI mode
Equalization	Adaptive cable equalization for up to 393 ft (120 m) (typical) of Belden 1694A coaxial cable for HD-SDI and 753 ft (230 m) (typical) of Belden 8281 coaxial cable for SD-SDI video

Outputs

SDI Video Output

Item	Specification
Number	2 reclocked, 4 synchronized
Standard	• 1080i (SMPTE 274M) at 25/29.97/30 Hz • 1080p (SMPTE 274M) at 23.98/24/25/29.97/30 Hz • 720p (SMPTE 296M) at 50/59.94/60 Hz • 525/625 (SMPTE 259M)
Connector	BNC (IEC169-8)
Impedance	75Ω
Return loss	• >18 dB (typical) from 5 MHz to 1485 MHz HD-SDI mode • >18 dB (typical) to 270 MHz SD-SDI mode
Signal level	800 mV ±10%
D.C. offset	0.0 V pk-to-pk ±0.5 V
Rise/fall time	• < 270 ps, within 100 ps of each other HD-SDI mode • 400-1500 ps (20 to 80% amplitude) SD-SDI mode
Overshoot	<10% of amplitude
Jitter	• >100 kHz: <135ps 10 Hz to 100 kHz: <675 ps in HD-SDI mode • < 0.2 UI (740 ps) peak-to-peak in SD-SDI mode
Delay	• 1080i/1080p: up to 8 frames less 2 lines • 720p: up to 16 frames less 2 lines • 525/625: up to 1 frame
Frame Synchronizer Locking Range	At least ±50 ppm

Reference Video

Item	Specification
Level	1 V pk-to-pk ± 3dB
Signal type	Analog composite NTSC/PAL-B or ±300 mV tri-level sync (1080i/1080p/720p)
Connector	BNC per IEC 169-8
Impedance	75Ω
Return loss	>35 dB to 30 MHz

Propagation Delay

Item	Specification
Processed video (minimum delay setting)	SD 525: 5.07µs SD 625: 5.07µs 1080i/29.97 Hz: 8.50µs 1080i/30 Hz: 8.50µs 1080p/29.97 Hz: 8.50µs 1080p/30 Hz: 8.50µs 720p/59.94 Hz: 8.40µs 720p/60 Hz 8.40µs 720p/50 Hz: 8.16µs 1080i/25 Hz: 8.40µs 1080p/25 Hz: 8.40µs 1080p/24 Hz: 8.0µs 1080p/23.98 Hz: 8.0µs
Re-clocked video	4.5 ns in SD-SDI mode and 1 ns in HD-SDI mode

Power Consumption

The total power consumption for the HFS6801**+** is approximately 7 W from the positive rail and 0.3 W from the negative rail.

Operating Temperature

The operating temperature for the HFS6801**+** module is 41° to 113°F (5° to 45°C).

Appendix A

Communication and Control Troubleshooting Tips

Overview

Find the following troubleshooting information in this appendix:

- “General Troubleshooting Steps” on page 46
- “Software Communication and Control Issues” on page 47
- “Hardware Communication and Control Issues” on page 51
- “Contacting Customer Service” on page 51

General Troubleshooting Steps

Follow these steps in troubleshooting 6800**+** product problems:

1. Review the “Software Communication and Control Issues” on page 47 outlined in this chapter.
2. Search this product manual and other associated documentation for answers to your question.

Note

Associated documentation for 6800**+** series products can generally be found in the product-specific manual that accompanies every module, in the *FR6802+ Frame Installation and Operation Manual*, and in the *6800+ Safety Instructions and Standards Manual*.

Product documentation (including manuals, online help, application notes, erratas, product release notes, and more) can be found on our Web site at www.broadcast.harris.com/leitch (Support section), along with technical support information, training information, product downloads, and a product knowledge base.

3. Contact your Customer Service representative if, after following these initial steps, you cannot resolve the issue.

   To contact Customer Service, see “Contacting Customer Service” on page 51.

Software Communication and Control Issues

- "+ Pilot Lite Fails to Communicate with Installed Modules" on page 47
- "+ Pilot Lite Does Not Find All Modules in Frame" on page 48
- "+ Pilot Lite or CCS Software Application Not Responding" on page 49
- "+ Pilot Lite Cannot Control a Module Showing in the Control Window" on page 49
- "+ Pilot Lite Status Bar Reports "Not Ready"" on page 49
- "CCS Software Application or Remote Control Panel Does Not Communicate with Module" on page 50
- "Alarm Query Fails When a Device Reboots" on page 50

+ Pilot Lite Fails to Communicate with Installed Modules

Confirm that the following items are not the reason for the communication failure:

- Proper module slot has not been specified (**+** Pilot Lite is not communicating with the appropriate slot). See your *FR6802+ Frame Installation and Operation Manual* for more information on slot identification.
- COM port is used elsewhere (Check that the correct COM port is configured in **+** Pilot Lite and that another application is not using that COM port).
- Actual frame ID does not match with the two DIP switch settings in the back of the frame (**+** Pilot Lite is not communicating with the proper frame). See your *FR6802+ Frame Installation and Operation Manual* for more information on frame ID switch settings.
- Null modem cable is not being used. Between the PC running **+** Pilot Lite and the FR6802**+** frame, there should be a null RS-232 modem cable. At minimum, this requires that pins 2 and 3 are crossed and 5 to 5 for ground.
- ICE6800**+** module is installed in the frame (**+** Pilot Lite control is disabled if an ICE6800**+** module is installed in the frame; ICE6800**+** modules are used for CCS control).

- A legacy 6800 series product is in the frame. + Pilot Lite cannot communicate with legacy 6800 series products. They will not be discovered or controlled by + Pilot Lite, although they can be installed in the FR6802+XF frame and work using card edge controls. The module must be from the 6800+ product family.
- Check that the back module does not have any bent pins, following this procedure:
  a. Unplug the front module.
  b. Unscrew and remove the back module.
  c. View the 20-pin spring connector at the bottom of the back module.(See Figure A-1.)

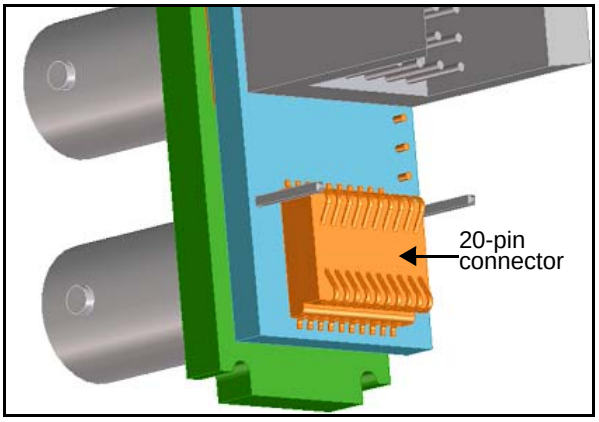

Figure A-1. Back Module to Front Module Connector

This connector should not have any bent or pressed pins. Even a slightly depressed or bent pin may cause genlock issues.

  d. If there are bent pins, carefully reposition them to their correct positions.

  If this is not possible, you can exchange the back module for a new one (order part number HFS6801+DR).

+ Pilot Lite Does Not Find All Modules in Frame

If a discovery is started too soon after frame power-up, + Pilot Lite will not find all the installed modules. Refresh + Pilot Lite (**File** > **Refresh**), and ensure that installed modules are fully powered-up first before discovery.

If a module is plugged into the frame after a discovery, + Pilot Lite does not automatically detect the module. Refresh + Pilot Lite (**File** > **Refresh**) to discover the newly installed module.

If a Legacy 6800 series product is in the frame, + Pilot Lite will not detect it. + Pilot Lite cannot communicate with legacy 6800 series products. They will not be discovered or controlled by + Pilot Lite although they can be installed in the FR6802+XF frame and work using card edge controls. For + Pilot Lite to find a module, it must be from the 6800+ product family.

+ Pilot Lite or CCS Software Application Not Responding

+ Pilot Lite and CCS applications such as Navigator or Pilot cannot run on the same PC at the same time. Both applications can be installed, but only one can be opened at a time.

+ Pilot Lite Cannot Control a Module Showing in the Control Window

Consider these questions:

- Did you physically set the jumper for local control? If so, set this jumper to the REM position for remote control.
- Does the card name in the control window physically match the card type in the frame?
- Is the module properly seated in the frame? Check the positioning of the module in its slot in the frame.
- Does the Control window indicate the device is “ready”? The device may be powered off or disconnected from the network.

+ Pilot Lite Status Bar Reports “Not Ready”

+ Pilot Lite reports each device’s connection status in the status bar. If the connection status message reads “Not Ready,” check the following:

- Is the module properly seated in the frame? Check the position of the module in the frame.
- Is the frame connected to the network? Check the device’s network connection.

If the status bar still reports no status or “Not Ready” for the frame or device, try restarting + Pilot Lite.

CCS Software Application or Remote Control Panel Does Not Communicate with Module

CCS software applications (such as Pilot, CoPilot, and Navigator) and remote control panels require the purchase and installation of an ICE6800**+** module in an FR6802**+** frame in order to communicate remotely via Ethernet.

Alarm Query Fails When a Device Reboots

When you reboot a device connected to your PC, the alarm traffic hitting the network may cause an alarm query request to time out and fail. While the query does not automatically retry, it will post an "Alarm query failed" message to the **Diagnostics** window.

To clear an "Alarm query failed" message, right-click inside the **Diagnostics** window, and then select **Refresh** from the resulting context menu.

Hardware Communication and Control Issues

- "Frames Fail to Communicate with the PC after a Power Failure" on page 51
- "Module Does Not Seem to Work" on page 51

Frames Fail to Communicate with the PC after a Power Failure

You must exit the software and restart after the frame recovers from its power failure. To restore communications between the PC and the frames, ensure that the frames have three or more minutes to recover from the power failure before you exit the application and restart the PC.

Module Does Not Seem to Work

Although the following troubleshooting tips may seem obvious, please take the time to ensure the following:

- All appropriate rear connections are securely made
- The board is securely installed (with no bent pins)
- The frame is turned on

Contacting Customer Service

We are committed to providing round-the-clock, 24-hour service to our customers around the world. Visit our Web site at /www.broadcast.harris.com/leitch and click on **Support** > **Technical Support** for information on how to contact the Customer Service team in your geographical region.

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Broadcast Communications Division
4393 Digital Way | Mason, OH USA 45040 | Tel: 1 (513) 459 3400
www.broadcast.harris.com

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